INVESTIGATOR'S ANNUAL REPORT

United States Department of the Interior

National Park Service

All or some of the information you provide may become available to the public.

OMB # (1024-0236)
Exp. Date (11/30/2010)
Form No. (10-226)

Reporting Year:	**Park:**	**Select the type of permit this report addresses:**
2008	Shenandoah NP	Scientific Study

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Project Title (maximum 300 characters):

Low-density residential development in northern Virginia Forests: Impact on Biodiversity

Park-assigned Study or Activity #:	**Park-assigned Permit #:**	**Permit Start Date:**	**Permit Expiration Date:**
SHEN-00326	SHEN-2006-SCI-0009	Mar 15, 2007	Jan 31, 2009

Scientific Study Starting Date: Mar 15, 2007	**Estimated Scientific Study Ending Date:** Jan 31, 2009

For either a Scientific Study or a Science Education Activity, the status is:	**For a Scientific Study that is completed, please check each of the following that applies:**
Suspended	__ A final report has been provided to the park or will be provided to the park within the next two years __ Copies of field notes, data files, photos, or other study records, as agreed, have been provided to the park __ All collected and retained specimens have been cataloged into the NPS catalog system and NPS has processed loan agreements as needed

Activity Type:

Research

Subject/Discipline:

Monitor Natural Resources

Purpose of Scientific Study or Science Education Activity during the reporting year (maximum 4000 characters):

Rural sprawl or exurban development (ED) is not a new trend but accelerating rapidly in the eastern US. It is defined as low-residential development (i.e. housing units) scattered outside the suburbs and cities. ED is often located adjacent to or nearby protected areas because confer attractive recreational and aesthetical amenities. Recent studies point out that one-tenth of the area and one-third of the housing units in the United States already are in areas where houses meet and intermingle with wildland vegetation. In addition, data from the 1999 National Resource Inventory demonstrates that forest loss due to housing and other development had increased more than 50% between the 1980 and 1990s. An average of 915,000 ha of forest was converted in the US between 1992 and 1997. To make matters worse, rural sprawl seems to be increasing more rapidly in areas with great conservation value, i.e. inside forests, next to protected lands, and along lakefronts.

The negative consequences of ED on biodiversity might be devastating. Urbanization and ED are the major causes for the federal

listing of threatened and endangered species in the United States. For example, as areas become increasingly urbanized, specialized species are lost rapidly, other species are gradually replaced by a few ubiquitous urban species, and frequently introduced and invasive species are found in cities elsewhere in the world.

Ecological and environmental dimensions of urbanization have been studied relatively intensely in urban and suburban areas (e.g., Marzluff 2001, McKinney 2002). However, little or no information is available about the consequences of ED in otherwise natural forest habitats and landscapes.

Our major research goal is to measure effects of exurban development in Northern Virginia. We want to conduct a multi-scale assessment of how this development is affecting biodiversity, particularly mammal and bird communities. The specific objectives of our work are to determine how exurban development affects bird and mammal communities, specifically:

(a) How does it affect bird diversity?

(b) How does it affect mammal diversity (not applicable for Shenandoah NP)?

(c) How does it affect behavior and ecology of urban avoiders and urban adapters (selected bird species)?

(d) What influence do urban exploiters have on biodiversity?

(e) How will species spectra change from natural like forest to low residential forest, suburban and urban areas?

Findings and status of Scientific Study or accomplishments of Science Education Activity during the reporting year (maximum 4000 characters):

Study was temporarily suspended due to funding problems. Might be resumed in 2009

For Scientific Studies (not Science Education Activities), were any specimens collected and removed from the park but not destroyed during analysis?

No

Funding specifically used in this park this reporting year that was provided by NPS (enter dollar amount):	**Funding specifically used in this park this reporting year that was provided by all other sources (enter dollar amount):**
$0	$0

List any other U.S. Government Agencies supporting this study or activity and the funding each provided this reporting year:

Paperwork Reduction Act Statement: A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. Public reporting for this collection of information is estimated to average 1.625 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the forms. Direct comments regarding this burden estimate or any aspect of this form to Dr. John G. Dennis, Natural Resources (3127 MIB), National Park Service, 1849 C Street, N.W., Washington, DC 20240.